REMARKS

Entry of the foregoing amendment to the claims upon which the International Preliminary Examination Report is based is respectfully requested prior to examination and calculation of the filing fees in the above-identified patent application.

Should there be any questions, the Examiner is invited to contact the undersigned at the below listed number.

Respectfully submitted,
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[0024] The reception apparatus according to the present invention comprises an amplification section that carries out processing of amplifying a received signal, a frequency conversion section that carries out processing of converting the frequency of the received signal amplified by the amplification section from a radio frequency to a baseband which is a lower frequency than the radio frequency, a gain control section that amplifies the received signal whose frequency has been converted by the frequency conversion section at a predetermined gain in divided stages of a first stage and a second stage, a voltage calibration section that performs calibration processing on an offset voltage of the received signal generated in the first stage and the second stage during the amplification by the gain control section in order from the first stage to the second stage, a filter section that lets pass the received signal in a predetermined band with any one of a first time constant and a second time constant which is reduced from the first time constant in each of the stages, a time constant control section that sets the time constant of the filter section as the second time constant before the calibration processing for each stage of the calibration processing and changes the time constant of the filter section included in the

stage in which the calibration processing is completed in order from the second time constant to the first time constant, and an operation control section that stops the operation of the amplification section or the frequency conversion section during the calibration processing in the first stage and causes the amplification section or the frequency conversion section to operate after the calibration processing in the first stage is completed and before the calibration processing in the second stage.

[0025]

[0026]

Advantageous Effect of the Invention

[0027] According to the present invention, it is possible to perform offset voltage calibration fast and with high accuracy even in an environment in which interferer exist, without causing degradation of noise characteristics.

[0046] When an operation control start signal stopping the operation of low noise amplifier 101 or quadrature demodulator 103 is input from second decoder 112, operation control circuit 113 performs such control as to stop the operation of low noise amplifier 101 or quadrature demodulator 103. When an operation control start signal not stopping the operation of low noise amplifier 101 or quadrature demodulator 103 is input from second decoder 112, operation control circuit 113 performs no control over low noise amplifier 101 and quadrature demodulator 103.

[0047]

[0067] When an operation control start signal stopping the operation of low noise amplifier 101 or quadrature demodulator 103 is input from decision section 313, operation control circuit 113 performs such control as to stop the operation of low noise amplifier 101 or quadrature demodulator 103. When an operation control start signal not stopping the operation of low noise amplifier 101 and quadrature demodulator 103 is input from decision section 313, operation control circuit 113 performs no control over low noise amplifier 101 and quadrature demodulator 103.

[0068]

[0111] When an operation control start signal is input, operation control circuit 513 performs such switching control as to operate one of first low noise amplifier 503 and second low noise amplifier 504 to which the received signal is not input then and stop the operation of the other one of first low noise amplifier 503 and second low noise amplifier 504 to which the received signal is input then.

[0112]

CLAIMS

1. (Deleted)

2. (Deleted)

13. (Deleted)

14. (Deleted)

15. (Deleted)

16. (Deleted)

17. (Deleted)

18. (Deleted)

19. (Deleted)

20. (Deleted)

21. (Deleted)

22. (Added) A reception apparatus comprising:

a first amplification section that carries out processing of amplifying a received signal;

a frequency conversion section that carries out processing of converting a frequency of the received signal amplified by the first amplification section from a radio frequency to a baseband comprising a lower frequency than the radio frequency;

a second amplification section that amplifies the received signal whose frequency has been converted by the frequency conversion section, at a predetermined gain, in divided stages comprising an earlier stage and a later stage;

a voltage calibration section that performs calibration processing on an offset voltage of the received signal generated in the earlier stage and the later stage during the amplification by the second amplification section, in order from the earlier stage

to the later stage;

a filter section that lets pass the received signal of a predetermined band at one of a first time constant, and a second time constant, which is a lower time constant than the first time constant, in each stage;

a time constant control section that sets a time constant of the filter section with the second time constant before the calibration processing for each stage of the calibration processing, and changes the time constant of the filter section included in the stage in which the calibration processing is completed in order from the second time constant to the first time constant; and

an operation control section that stops the operation of the first amplification section during the calibration processing in the earlier stage and causes the first amplification section to operate after the calibration processing in the earlier stage is completed, before the calibration processing in the later stage.

23. (Added) The reception apparatus according to claim 22, wherein:

the first amplification section is provided for each of received signals of a plurality of different bands and performs amplification processing for each band; and

the operation control section, during the calibration processing in the earlier stage, stops the

operation of the first amplification section used for amplification of the received signal of a band subjected to reception processing and performs switching so as to cause the first amplification section used for amplification of the received signal of a band not subjected to reception processing to operate, and, after the calibration processing in the earlier stage is completed, before the calibration processing in the later stage, performs switching so as to cause the first amplification section used for amplification of the received signal in the band subjected to reception processing to operate and stop the operation of the first amplification section used for amplification of the received signal in the band not subjected to reception processing.

24. (Added) The reception apparatus according to claim 23, wherein the operation control section performs the switching using the first amplification section for a band not used in a nearby cell as the first amplification section used for amplification of the received signal of the band not subjected to reception processing.

25. (Added) The reception apparatus according to claim 23, further comprising a storage section that stores first selection information which associates a band and the first amplification section,

wherein the operation control section selects the first amplification section to be stopped and the first amplification section to be operated with reference to the first selection information using band information reported from a communicating party.

26. (Added) The reception apparatus according to claim 23, further comprising a storage section that stores second selection information which associates position information, the band and the first amplification section,

wherein the operation control section selects the first amplification section to be stopped and the first amplification section to be operated with reference to the second selection information using the position information indicating a position of the reception apparatus.

27. (Added) The reception apparatus according to claim 22, wherein, when the gain is equal to or above a threshold, the operation control section stops the processing of the first amplification section when the voltage calibration section calibrates the offset voltage of the received signal, and, when the gain is below the threshold, the operation control section performs switching so as to cause the first amplification section to operate when the voltage calibration section calibrates the offset

voltage of the received signal.

28. (Added) The reception apparatus according to claim 22, further comprising a detection section that detects a level of reception power of the received signal whose frequency has been converted by the frequency conversion section,

wherein, when the level of reception power detected by the detection section is equal to or above a threshold, the operation control section stops processing of the first amplification section when the voltage calibration section calibrates the offset voltage of the received signal, and, when the level of reception power detected by the detection section is below the threshold, the operation control section performs switching so as to cause the first amplification section to operate when the voltage calibration section calibrates the offset voltage of the received signal.

29. (Added) A reception method comprising:

a first step of carrying out processing of amplifying a received signal;

a second step of carrying out processing of converting a frequency of the received signal amplified from a radio frequency to a baseband comprising a lower frequency than the radio frequency;

a third step of amplifying the received signal whose

frequency has been converted, at a predetermined gain, in divided stages comprising an earlier stage and a later stage;

a fourth step of performing calibration processing on an offset voltage of the received signal generated in the earlier stage and the later stage during the amplification in the third step in order from the earlier stage to the later stage;

a fifth step of letting pass a predetermined band of the received signal at one of a first time constant, and a second time constant, which is a lower time constant than the first time constant, in each stage;

a sixth step of setting a time constant in the fifth step with the second time constant before the calibration processing for each stage of the calibration processing, and changing the time constant in the fifth step included in the stage in which the calibration processing is completed in order from the second time constant to the first time constant; and

a seventh step of stopping the operation of amplifying the received signal in the first step during the calibration processing in the earlier stage and causing amplification of the received signal in the first step to be performed after the calibration processing in the earlier stage is completed, before the calibration processing in the later stage.

30. (Added) A semiconductor integrated circuit apparatus comprising:

a first amplification circuit that carries out processing of amplifying a received signal;

a frequency conversion circuit that carries out processing of converting a frequency of the received signal amplified by the first amplification circuit from a radio frequency to a baseband comprising a lower frequency than the radio frequency;

a second amplification circuit that amplifies the received signal whose frequency has been converted by the frequency conversion circuit, at a predetermined gain, in divided stages comprising an earlier stage and a later stage;

a voltage calibration circuit that performs calibration processing on an offset voltage of the received signal generated in the earlier stage and the later stage during the amplification by the second amplification circuit in order from the earlier stage to the later stage;

a filter circuit that lets pass the received signal of a predetermined band at one of a first time constant, and a second time constant, which is a lower time constant than the first time constant, in each stage;

a time constant control circuit that sets a time constant of the filter circuit with the second time constant before the calibration processing for each stage

of the calibration processing and changes the time constant of the filter circuit included in the stage in which the calibration processing is completed in order from the second time constant to the first time constant; and

an operation control circuit that stops the operation of the first amplification circuit during the calibration processing in the earlier stage and causes the first amplification circuit to operate after the calibration processing in the earlier stage is completed, before the calibration processing in the later stage.